

What is claimed is:

- 1 1. A system for collection and analysis of patient information for
2 automated remote patient care, comprising:
3 a medical device adapted to be implanted for an individual patient
4 regularly recording and storing measures sets comprising individual measures
5 which each relate to patient information;
6 a database collecting one or more patient care records, organizing one or
7 more patient care records which each comprise a plurality of the collected
8 measures sets, and storing the collected measures set into a patient care record for
9 the individual patient within a database; and
10 a server periodically receiving a set of the collected measures from
11 the medical device adapted to be implanted, and analyzing one or more of the
12 collected measures sets in the patient care record for the individual patient relative
13 to one or more other collected measures sets stored in the database server to
14 determine a patient status indicator.
- 1 2. A system according to Claim 1, the server further comprising:
2 a comparison module comparing an initial measure selected from the one
3 or more collected measures sets to a sibling measure selected from the one or
4 more other collected measures sets, the initial measure and the sibling measure
5 both relating to the same type of patient information.
- 1 3. A system according to Claim 1, the server further comprising:
2 a derivation module determining an initial derived measure using at least
3 one measure selected from the one or more collected measures sets and
4 determining a sibling derived measure using at least one measure selected from
5 the one or more other collected measures sets, the initial derived measure and the
6 sibling derived measure both relating to the same type of derived patient
7 information; and
8 a comparison module comparing the initial derived measure to the sibling
9 derived measure.

1 4. A system according to Claim 1, the server further comprising:
2 a comparison module comparing an initial measure selected from the one
3 or more collected measures sets to a peer measure selected from the one or more
4 other collected measures sets, the initial measure relating to a different type of
5 patient information than the peer measure.

1 5. A system according to Claim 1, the server further comprising:
2 a derivation module determining a peer derived measure using at least one
3 measure selected from the one or more other collected measures sets; and
4 a comparison module comparing an initial measure selected from the one
5 or more collected measures sets to the peer derived measure, the initial measure
6 relating to a different type of patient information than the derived patient
7 information to which the peer derived measure relates.

1 6. A system according to Claim 1, the server further comprising:
2 a derivation module determining an initial derived measure using at least
3 one measure selected from the one or more collected measures sets; and
4 a comparison module comparing the initial derived measure to a peer
5 measure selected from the one or more other collected measures sets, the initial
6 derived measure relating to a different type of derived patient information than the
7 patient information to which the peer measure relates.

1 7. A system according to Claim 1, the server further comprising:
2 a derivation module determining an initial derived measure using at least
3 one measure selected from the one or more collected measures sets and
4 determining a peer derived measure using at least one measure selected from the
5 one or more other collected measures sets; and
6 a comparison module comparing the initial derived measure to the peer
7 derived measure, the initial derived measure relating to a different type of derived
8 patient information than the derived patient information to which the peer derived
9 measure relates.

1 8. A system according to Claim 1, wherein the one or more other
2 collected measures sets are stored in the patient care record for the individual
3 patient for whom the patient care indicator has been determined.

1 9. A system according to Claim 1, wherein the one or more other
2 collected measures sets are stored in the patient care records for a group of one or
3 more other individual patients.

1 10. A system according to Claim 1, further comprising:
2 a collection client communicatively interposed between the medical
3 device adapted to be implanted and the communications link, the collection client
4 retrieving the collected measures set and downloading the collected measures set
5 from the collection client into the network server over the communications link.

1 11. A system according to Claim 10, wherein the collection client is
2 selected from the group consisting of a programmer, interrogator, recorder,
3 monitor, telemetered signals transceiver, personal computer, digital data
4 processor, and combinations thereof.

1 12. A system according to Claim 1, the server being interfaced to a
2 feedback communications link and further comprising:
3 a feedback client interfaced to the feedback communications link over
4 which automated feedback based on the patient status indicator is provided to the
5 individual patient from the server.

1 13. A system according to Claim 12, the server further comprising:
2 a feedback module providing tiered feedback comprising:
3 at a first level of feedback, communicating an interpretation of the
4 patient status indicator to the individual patient;
5 at a second level of feedback, communicating a notification of
6 potential medical concern based on the patient status indicator to the individual
7 patient;

8 at a third level of feedback, communicating a notification of
9 potential medical concern based on the patient status indicator to medical
10 personnel in local proximity to the individual patient; and
11 at a fourth level of feedback, communicating a set of
12 reprogramming instructions based on the patient status indicator to the
13 implantable medical device.

1 14. A system according to Claim 12, wherein the automated feedback
2 comprises at least one of the group consisting of a peer group status indicator, a
3 historical status indicator, a trend indicator, a medicinal efficacy indicator, and a
4 wellness indicator.

1 15. A system according to Claim 12, wherein the feedback
2 communications link comprises at least one of the following: internetwork link,
3 intranetwork link, serial link, data telephone link, satellite link, radio-frequency
4 link, infrared link, fiber optic link, coaxial cable link, television link, and
5 combinations thereof.

1 16. A system according to Claim 12, wherein the feedback client is
2 selected from the group consisting of a personal computer, facsimile machine,
3 telephone instrument, network computer, wireless computer, personal data
4 assistant, television, digital data processor, and combinations thereof.

1 17. A system according to Claim 1, the server further comprising:
2 an analysis module dynamically analyzing the one or more of the collected
3 measures sets in the patient care record for the individual patient.

1 18. A system according to Claim 1, the server further comprising:
2 an analysis module analyzing the one or more of the collected measures
3 sets in the patient care record for the individual patient in a batch comprising the
4 one or more of the collected measures sets in patient care records for a plurality of
5 individual patients.

1 19. A system according to Claim 1, wherein the communications link
2 comprises at least one of the following: internetwork link, intranetwork link,
3 serial link, data telephone link, satellite link, radio-frequency link, infrared link,
4 fiber optic link, coaxial cable link, television link, and combinations thereof.

1 20. A system according to Claim 1, wherein the database comprises at
2 least one of the following: volatile storage, non-volatile storage, removable
3 storage, fixed storage, random access storage, sequential access storage,
4 permanent storage, erasable storage, and combinations thereof.

1 21. A system according to Claim 1, wherein the organization of the
2 database comprises at least one of the following: flat file, hierarchical database
3 server, relational database server, distributed database server, and combinations
4 thereof.

1 22. A system according to Claim 1, wherein the server is selected from
2 the group consisting of a personal computer, minicomputer, mainframe computer,
3 supercomputer, parallel computer, workstation, digital data processor, and
4 combinations thereof.

1 23. A system according to Claim 1, wherein the medical device is
2 selected from the group consisting of a pacemaker, implantable cardioverter
3 defibrillator, implantable heart failure monitor, implantable event monitor,
4 implantable cardiopulmonary monitor, implantable metabolic monitor or device,
5 endocrinology monitor or device, hematology monitor or device, implantable
6 neuromuscular monitor or device, implantable gastrointestinal monitor or device,
7 genitourinary monitor or device, and combinations thereof.

1 24. A system according to Claim 1, wherein the set of collected
2 measures comprises at least one of the following: atrial electrical activity,
3 ventricular electrical activity, time of day, activity level, cardiac output, oxygen
4 level, cardiovascular pressure measures, pulmonary measures, interventions
5 made, and combinations thereof.

1 25. A system according to Claim 24, the set of collected measures
2 further comprising derived measures selected from the group consisting of linear
3 measures derived from the set of collected measures, non-linear measures derived
4 from the set of collected measures, and combinations thereof.

1 26. A method for collection and analysis of patient information for
2 automated remote patient care, comprising:
3 regularly recording and storing measures sets comprising individual
4 measures which each relate to patient information by a medical device adapted to
5 be implanted for an individual patient;
6 periodically receiving a set of the collected measures from the medical
7 device adapted to be implanted;
8 collecting one or more patient care records into a database, comprising:
9 organizing one or more patient care records which each comprise a
10 plurality of the collected measures sets;
11 storing the collected measures set into a patient care record for the
12 individual patient within the database; and
13 analyzing one or more of the collected measures sets in the patient care
14 record for the individual patient relative to one or more other collected measures
15 sets stored in the database to determine a patient status indicator.

1 27. A method according to Claim 26, the operation of analyzing the
2 one or more collected measures sets further comprising:
3 comparing an initial measure selected from the one or more collected
4 measures sets to a sibling measure selected from the one or more other collected
5 measures sets, the initial measure and the sibling measure both relating to the
6 same type of patient information.

1 28. A method according to Claim 26, the operation of analyzing the
2 one or more collected measures sets further comprising:
3 determining an initial derived measure using at least one measure selected
4 from the one or more collected measures sets;

5 determining a sibling derived measure using at least one measure selected
6 from the one or more other collected measures sets, the initial derived measure
7 and the sibling derived measure both relating to the same type of derived patient
8 information; and
9 comparing the initial derived measure to the sibling derived measure.

1 29. A method according to Claim 26, the operation of analyzing the
2 one or more collected measures sets further comprising:

3 comparing an initial measure selected from the one or more collected
4 measures sets to a peer measure selected from the one or more other collected
5 measures sets, the initial measure relating to a different type of patient
6 information than the peer measure.

1 30. A method according to Claim 26, the operation of analyzing the
2 one or more collected measures sets further comprising:

3 determining a peer derived measure using at least one measure selected
4 from the one or more other collected measures sets; and
5 comparing an initial measure selected from the one or more collected
6 measures sets to the peer derived measure, the initial measure relating to a
7 different type of patient information than the derived patient information to which
8 the peer derived measure relates.

1 31. A method according to Claim 26, the operation of analyzing the
2 one or more collected measures sets further comprising:

3 determining an initial derived measure using at least one measure selected
4 from the one or more collected measures sets; and
5 comparing the initial derived measure to a peer measure selected from the
6 one or more other collected measures sets, the initial derived measure relating to a
7 different type of derived patient information than the patient information to which
8 the peer measure relates.

1 32. A method according to Claim 26, the operation of analyzing the
2 one or more collected measures sets further comprising:

3 determining an initial derived measure using at least one measure selected
4 from the one or more collected measures sets;
5 determining a peer derived measure using at least one measure selected
6 from the one or more other collected measures sets; and
7 comparing the initial derived measure to the peer derived measure, the
8 initial derived measure relating to a different type of derived patient information
9 than the derived patient information to which the peer derived measure relates.

1 33. A method according to Claim 26, wherein the one or more other
2 collected measures sets are stored in the patient care record for the individual
3 patient for whom the patient care indicator has been determined.

1 34. A method according to Claim 26, wherein the one or more other
2 collected measures sets are stored in the patient care records for a group of one or
3 more other individual patients.

1 35. A method according to Claim 26, further comprising:
2 retrieving the collected measures set into a collection client
3 communicatively interposed between the medical device adapted to be implanted
4 and a network server; and
5 downloading the collected measures set from the collection client into the
6 network server.

1 36. A method according to Claim 35, wherein the collection client is
2 selected from the group consisting of a programmer, interrogator, recorder,
3 monitor, telemetered signals transceiver, personal computer, digital data
4 processor, and combinations thereof.

1 37. A method according to Claim 26, further comprising:
2 providing automated feedback based on the patient status indicator to the
3 individual patient configured between a network server and a feedback client.

1 38. A method according to Claim 37, further comprising:
2 providing tiered feedback comprising:

3 at a first level of feedback, communicating an interpretation of the
4 patient status indicator to the individual patient;
5 at a second level of feedback, communicating a notification of
6 potential medical concern based on the patient status indicator to the individual
7 patient;
8 at a third level of feedback, communicating a notification of
9 potential medical concern based on the patient status indicator to medical
10 personnel in local proximity to the individual patient; and
11 at a fourth level of feedback, communicating a set of
12 reprogramming instructions based on the patient status indicator to the
13 implantable medical device.

1 39. A method according to Claim 37, wherein the automated feedback
2 comprises at least one of the group consisting of a peer group status indicator, a
3 historical status indicator, a trend indicator, a medicinal efficacy indicator, and a
4 wellness indicator.

1 40. A method according to Claim 37, wherein a feedback
2 communications link comprises at least one of the following: internetwork link,
3 intranetwork link, serial link, data telephone link, satellite link, radio-frequency
4 link, infrared link, fiber optic link, coaxial cable link, television link, and
5 combinations thereof.

1 41. A method according to Claim 37, wherein the feedback client is
2 selected from the group consisting of a personal computer, facsimile machine,
3 telephone instrument, network computer, wireless computer, personal data
4 assistant, television, digital data processor, and combinations thereof.

1 42. A method according to Claim 26, further comprising:
2 dynamically analyzing the one or more of the collected measures sets in
3 the patient care record for the individual patient.

1 43. A method according to Claim 26, further comprising:

2 analyzing the one or more of the collected measures sets in the patient care
3 record for the individual patient in a batch comprising the one or more of the
4 collected measures sets in patient care records for a plurality of individual
5 patients.

1 44. A method according to Claim 26, wherein a communications link
2 comprises at least one of the following: internetwork link, intranetwork link,
3 serial link, data telephone link, satellite link, radio-frequency link, infrared link,
4 fiber optic link, coaxial cable link, television link, and combinations thereof.

1 45. A method according to Claim 26, wherein the database comprises
2 at least one of the following: volatile storage, non-volatile storage, removable
3 storage, fixed storage, random access storage, sequential access storage,
4 permanent storage, erasable storage, and combinations thereof.

1 46. A method according to Claim 45, wherein an organization of the
2 database comprises at least one of the following: flat file, hierarchical database
3 server, relational database server, distributed database server, and combinations
4 thereof.

1 47. A method according to Claim 26, wherein a server is selected from
2 the group consisting of a personal computer, minicomputer, mainframe computer,
3 supercomputer, parallel computer, workstation, digital data processor, and
4 combinations thereof.

1 48. A method according to Claim 26, wherein the medical device is
2 selected from the group consisting of a pacemaker, implantable cardioverter
3 defibrillator, implantable heart failure monitor, implantable event monitor,
4 implantable cardiopulmonary monitor, implantable metabolic monitor or device,
5 endocrinology monitor or device, hematological monitor or device, implantable
6 neuromuscular monitor or device, implantable gastrointestinal monitor or device,
7 genitourinary monitor or device, and combinations thereof.

1 49. A method according to Claim 26, wherein the set of collected
2 measures comprises at least one of the following: atrial electrical activity,
3 ventricular electrical activity, time of day, activity level, cardiac output, oxygen
4 level, cardiovascular pressure measures, pulmonary measures, interventions
5 made, and combinations thereof.

1 50. A method according to Claim 49, the set of collected measures
2 further comprising derived measures selected from the group consisting of linear
3 measures derived from the set of collected measures, non-linear measures derived
4 from the set of collected measures, and combinations thereof.

1 51. A computer-readable storage medium holding code for collection
2 and analysis of patient information for automated remote patient care, comprising:
3 code for regularly recording and storing measures sets comprising
4 individual measures which each relate to patient information by a medical device
5 adapted to be implanted for an individual patient;
6 code for periodically receiving a set of the collected measures from the
7 medical device adapted to be implanted;
8 code for collecting one or more patient care records into a database,
9 comprising organizing one or more patient care records which each comprise a
10 plurality of the collected measures sets, and storing the collected measures set into
11 a patient care record for the individual patient within the database; and
12 code for analyzing one or more of the collected measures sets in the
13 patient care record for the individual patient relative to one or more other
14 collected measures sets stored in the database to determine a patient status
15 indicator.

1 52. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating a comparison module comparing an initial measure
4 selected from the one or more collected measures sets to a sibling measure

5 selected from the one or more other collected measures sets, the initial measure
6 and the sibling measure both relating to the same type of patient information.

1 53. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating a derivation module determining an initial derived
4 measure using at least one measure selected from the one or more collected
5 measures sets and determining a sibling derived measure using at least one
6 measure selected from the one or more other collected measures sets, the initial
7 derived measure and the sibling derived measure both relating to the same type of
8 derived patient information; and
9 code for operating a comparison module comparing the initial derived
10 measure to the sibling derived measure.

1 54. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating a comparison module comparing an initial measure
4 selected from the one or more collected measures sets to a peer measure selected
5 from the one or more other collected measures sets, the initial measure relating to
6 a different type of patient information than the peer measure.

1 55. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating a derivation module determining a peer derived
4 measure using at least one measure selected from the one or more other collected
5 measures sets; and
6 code for operating a comparison module comparing an initial measure
7 selected from the one or more collected measures sets to the peer derived
8 measure, the initial measure relating to a different type of patient information than
9 the derived patient information to which the peer derived measure relates.

1 56. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:

3 code for operating a derivation module determining an initial derived
4 measure using at least one measure selected from the one or more collected
5 measures sets; and
6 code for operating a comparison module comparing the initial derived
7 measure to a peer measure selected from the one or more other collected measures
8 sets, the initial derived measure relating to a different type of derived patient
9 information than the patient information to which the peer measure relates.

1 57. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating a derivation module determining an initial derived
4 measure using at least one measure selected from the one or more collected
5 measures sets and determining a peer derived measure using at least one measure
6 selected from the one or more other collected measures sets; and
7 code for operating a comparison module comparing the initial derived
8 measure to the peer derived measure, the initial derived measure relating to a
9 different type of derived patient information than the derived patient information
10 to which the peer derived measure relates.

1 58. A storage medium according to Claim 51, further comprising:
2 code for operating a collection client communicatively interposed between
3 the medical device adapted to be implanted and a network server, the collection
4 client retrieving the collected measures set and downloading the collected
5 measures set from the collection client into the network server.

1 59. A storage medium according to Claim 51, further comprising:
2 code for operating a feedback client interfaced to a feedback
3 communications link over which automated feedback based on the patient status
4 indicator is provided to the individual patient from the network server.

1 60. A storage medium according to Claim 59, the code for analyzing
2 one or more of the collected measures sets further comprising:

3 code for operating a feedback module providing tiered feedback
4 comprising:
5 at a first level of feedback, code for operatively communicating an
6 interpretation of the patient status indicator to the individual patient over the
7 feedback communications link;
8 at a second level of feedback, code for operatively communicating
9 a notification of potential medical concern based on the patient status indicator to
10 the individual patient over the feedback communications link;
11 at a third level of feedback, code for operatively communicating a
12 notification of potential medical concern based on the patient status indicator to
13 medical personnel in local proximity to the individual patient over the feedback
14 communications link; and
15 at a fourth level of feedback, code for operatively communicating a
16 set of reprogramming instructions based on the patient status indicator to the
17 implantable medical device over the feedback communications link.

1 61. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating an analysis module dynamically analyzing the one or
4 more of the collected measures sets in the patient care record for the individual
5 patient.

1 62. A storage medium according to Claim 51, the code for analyzing
2 one or more of the collected measures sets further comprising:
3 code for operating an analysis module analyzing the one or more of the
4 collected measures sets in the patient care record for the individual patient in a
5 batch comprising the one or more of the collected measures sets in patient care
6 records for a plurality of individual patients.

1 63. A system for collection and analysis of patient information for
2 automated remote patient care, comprising:
3 a database collecting one or more patient care records, comprising:

4 a schema defining each patient care record comprising a plurality
5 of collected measurements sets; and
6 each collected measurements set comprising individual
7 measurements which each relate to patient information recorded by a medical
8 device adapted to be implanted for an individual patient;
9 a server processing at least one of the collected measurements sets,
10 comprising:
11 a receiver receiving a set of the collected measurements regularly
12 stored and periodically sent from the implantable medical device;
13 a database module storing the collected measurements set into the
14 patient care record in the database for the individual patient;
15 an analysis module analyzing one or more of the collected
16 measurements sets in the patient care record for the individual patient relative to
17 one or more other collected measurements sets stored in the patient care record of
18 the individual patient; and
19 a feedback module sending feedback based on the analysis of the
20 one or more collected measurements sets .

1 64. A system according to Claim 63, the analysis module further
2 comprising:
3 a comparison module comparing at least one collected measurement
4 selected from the one or more collected measurements sets to at least one other
5 collected measurement selected from the one or more other collected
6 measurements sets, the at least one collected measurement and the at least one
7 other collected measurement both relating to the same type of patient information.

1 65. A system according to Claim 63, the analysis module further
2 comprising:
3 a comparison module comparing at least one collected measurement
4 selected from the one or more collected measurements sets to at least one other
5 collected measurement selected from the one or more other collected
6 measurements sets, the at least one collected measurement and the at least one

7 other collected measurement both relating to different types of patient
8 information.

1 66. A system according to Claim 63, the analysis module further
2 comprising:

3 a derivation module determining at least one derived measurement using
4 at least one collected measurement selected from at least one of the one or more
5 collected measurements sets and the one or more other collected measurements
6 sets; and

7 a comparison module comparing the at least one derived measurement to
8 at least one measurement selected from at least one of the one or more collected
9 measurements sets and the one or more other collected measurements sets.

1 67. A system according to Claim 63, the analysis module further
2 comprising:

3 a derivation module determining at least one derived measurement using
4 at least one collected measurement selected from at least one of the one or more
5 collected measurements sets and the one or more other collected measurements
6 sets and determining at least one other derived measurement using at least one
7 collected measurement selected from at least one of the one or more collected
8 measurements sets and the one or more other collected measurements sets; and

9 a comparison module comparing the at least one derived measurement to
10 the at least one other derived measurement.

1 68. A system according to Claim 63, the feedback module further
2 comprising providing tiered feedback comprising:

3 at a first level of feedback, communicating an interpretation of the analysis
4 of the one or more collected measurements sets to the individual patient;

5 at a second level of feedback, communicating a notification of potential
6 medical concern based on the analysis of the one or more collected measurements
7 sets to the individual patient;

8 at a third level of feedback, communicating a notification of potential
9 medical concern based on the analysis of the one or more collected measurements
10 sets to medical personnel in local proximity to the individual patient; and
11 at a fourth level of feedback, communicating a set of reprogramming
12 instructions based on analysis of the one or more collected measurements sets to
13 the implantable medical device.

1 69. A method for collection and analysis of patient information for
2 automated remote patient care, comprising:
3 collecting one or more patient care records in a database, comprising:
4 defining each patient care record comprising a plurality of
5 collected measurements sets; and
6 specifying each collected measurements set comprising individual
7 measurements which each relate to patient information recorded by a medical
8 device adapted to be implanted for an individual patient;
9 processing at least one of the collected measurements sets, comprising:
10 receiving a set of the collected measurements regularly stored and
11 periodically sent from the implantable medical device;
12 storing the collected measurements set into the patient care record
13 in the database for the individual patient;
14 analyzing one or more of the collected measurements sets in the
15 patient care record for the individual patient relative to one or more other
16 collected measurements sets stored in the patient care record of the individual
17 patient; and
18 sending feedback based on the analysis of the one or more
19 collected measurements sets.

1 70. A method according to Claim 69, the operation of analyzing
2 further comprising:
3 comparing at least one collected measurement selected from the one or
4 more collected measurements sets to at least one other collected measurement
5 selected from the one or more other collected measurements sets, the at least one

6 collected measurement and the at least one other collected measurement both
7 relating to the same type of patient information.

1 71. A method according to Claim 69, the operation of analyzing
2 further comprising:
3 comparing at least one collected measurement selected from the one or
4 more collected measurements sets to at least one other collected measurement
5 selected from the one or more other collected measurements sets, the at least one
6 collected measurement and the at least one other collected measurement both
7 relating to different types of patient information.

1 72. A method according to Claim 69, the operation of analyzing
2 further comprising:
3 determining at least one derived measurement using at least one collected
4 measurement selected from at least one of the one or more collected
5 measurements sets and the one or more other collected measurements sets; and
6 comparing the at least one derived measurement to at least one
7 measurement selected from at least one of the one or more collected
8 measurements sets and the one or more other collected measurements sets.

1 73. A method according to Claim 69, the operation of analyzing
2 further comprising:
3 determining at least one derived measurement using at least one collected
4 measurement selected from at least one of the one or more collected
5 measurements sets and the one or more other collected measurements sets;
6 determining at least one other derived measurement using at least one
7 collected measurement selected from at least one of the one or more collected
8 measurements sets and the one or more other collected measurements sets; and
9 comparing the at least one derived measurement to the at least one other
10 derived measurement.

1 74. A method according to Claim 69, the operation of sending
2 feedback further comprising:

3 providing tiered feedback comprising:
4 at a first level of feedback, communicating an interpretation of the
5 analysis of the one or more collected measurements sets to the individual patient;
6 at a second level of feedback, communicating a notification of
7 potential medical concern based on the analysis of the one or more collected
8 measurements sets to the individual patient;
9 at a third level of feedback, communicating a notification of
10 potential medical concern based on the analysis of the one or more collected
11 measurements sets to medical personnel in local proximity to the individual
12 patient; and
13 at a fourth level of feedback, communicating a set of
14 reprogramming instructions based on analysis of the one or more collected
15 measurements sets to the implantable medical device.

1 75. A computer-readable storage medium holding code for collection
2 and analysis of patient information for automated remote patient care, comprising:
3 code for collecting one or more patient care records in a database,
4 comprising:
5 code for defining each patient care record comprising a plurality of
6 collected measurements sets; and
7 code for specifying each collected measurements set comprising
8 individual measurements which each relate to patient information recorded by a
9 medical device adapted to be implanted for an individual patient;
10 code for processing information for at least one of the collected
11 measurements sets, comprising:
12 code for receiving a set of the collected measurements regularly
13 stored and periodically sent from the implantable medical device;
14 code for storing the collected measurements set into the patient
15 care record in the database for the individual patient;
16 code for analyzing one or more of the collected measurements sets
17 in the patient care record for the individual patient relative to one or more other

18 collected measurements sets stored in the patient care record of the individual
19 patient; and
20 code for sending feedback based on the analysis of the one or more
21 collected measurements sets.

1 76. A storage medium according to Claim 75, the operation of
2 analyzing further comprising:
3 code for comparing at least one collected measurement selected from the
4 one or more collected measurements sets to at least one other collected
5 measurement selected from the one or more other collected measurements sets,
6 the at least one collected measurement and the at least one other collected
7 measurement both relating to the same type of patient information.

1 77. A storage medium according to Claim 75, the operation of
2 analyzing further comprising:
3 code for comparing at least one collected measurement selected from the
4 one or more collected measurements sets to at least one other collected
5 measurement selected from the one or more other collected measurements sets,
6 the at least one collected measurement and the at least one other collected
7 measurement both relating to different types of patient information.

1 78. A storage medium according to Claim 75, the operation of
2 analyzing further comprising:
3 code for determining at least one derived measurement using at least one
4 collected measurement selected from at least one of the one or more collected
5 measurements sets and the one or more other collected measurements sets; and
6 code for comparing the at least one derived measurement to at least one
7 measurement selected from at least one of the one or more collected
8 measurements sets and the one or more other collected measurements sets.

1 79. A storage medium according to Claim 75, the operation of
2 analyzing further comprising:

3 code for determining at least one derived measurement using at least one
4 collected measurement selected from at least one of the one or more collected
5 measurements sets and the one or more other collected measurements sets;
6 code for determining at least one other derived measurement using at least
7 one collected measurement selected from at least one of the one or more collected
8 measurements sets and the one or more other collected measurements sets; and
9 code for comparing the at least one derived measurement to the at least
10 one other derived measurement.

1 80. A storage medium according to Claim 75, the operation of sending
2 feedback further comprising:

3 code for providing tiered feedback comprising:

4 at a first level of feedback, code for communicating an
5 interpretation of the analysis of the one or more collected measurements sets to
6 the individual patient;

7 at a second level of feedback, code for communicating a
8 notification of potential medical concern based on the analysis of the one or more
9 collected measurements sets to the individual patient;

10 at a third level of feedback, code for communicating a notification
11 of potential medical concern based on the analysis of the one or more collected
12 measurements sets to medical personnel in local proximity to the individual
13 patient; and

14 at a fourth level of feedback, code for communicating a set of
15 reprogramming instructions based on analysis of the one or more collected
16 measurements sets to the implantable medical device.

1 81. A system for automated remote cardiac patient care using
2 cardiovascular patient information retrieved from a cardiac monitoring device
3 adapted to be implanted in a patient, comprising:

4 a telemetry transceiver retrieving on a substantially regular basis a set of
5 cardiovascular measurements regularly recorded by and stored in the cardiac

6 monitoring device adapted to be implanted and periodically communicating the
7 collected cardiovascular measurements set;
8 a centralized server, comprising:
9 a database module storing the collected cardiovascular
10 measurements set into a patient care record for the individual patient;
11 a database coupled to the centralized server organizing a plurality
12 of patient care records in the database, comprising defining each patient care
13 record comprising a plurality of the collected cardiovascular measurements sets,
14 and specifying each collected cardiovascular measurements set comprising
15 individual cardiovascular measurements which each relate to patient information
16 recorded by the cardiac monitoring device for an individual patient;
17 an analysis module analyzing one or more of the collected
18 cardiovascular measurements sets in the patient care record for the individual
19 patient relative to one or more other collected cardiovascular measurements sets
20 stored in the patient care records in the database; and
21 a feedback module sending feedback based on the analysis of the
22 one or more collected cardiovascular measurements sets to the individual patient.

1 82. A method for automated remote cardiac patient care using
2 cardiovascular patient information retrieved from a cardiac monitoring device
3 adapted to be implanted in a patient, comprising:
4 retrieving on a substantially regular basis a set of cardiovascular
5 measurements regularly recorded by and stored in the cardiac monitoring device
6 adapted to be implanted;
7 periodically communicating the collected cardiovascular measurements set
8 to a centralized server;
9 storing the collected cardiovascular measurements set into a patient care
10 record for the individual patient in a database coupled to the centralized server;
11 organizing a plurality of patient care records in the database, comprising:
12 defining each patient care record comprising a plurality of the
13 collected cardiovascular measurements sets; and

14 specifying each collected cardiovascular measurements set
15 comprising individual cardiovascular measurements which each relate to patient
16 information recorded by the cardiac monitoring device for an individual patient;
17 analyzing one or more of the collected cardiovascular measurements sets
18 in the patient care record for the individual patient relative to one or more other
19 collected cardiovascular measurements sets stored in the patient care records in
20 the database; and
21 sending feedback based on the analysis of the one or more collected
22 cardiovascular measurements sets to the individual patient.